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In the matter of an
application under the
Ontario Energy Board Act
by
Union Gas Limited
for an
Extension to
the Bickford Storage Pool

E.B.O. 123

REPORT OF THE BOARD

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E.B.O. 123

IN THE MATTER OF the Ontario Energy
Board Act, R.S.O. 1980, Chapter 332;

AND IN THE MATTER OF an Application by Union Gas Limited pursuant to Section 35 of the said Act, for a Regulation designating certain lands as a gas storage area;

AND IN THE MATTER OF an Application by
Union Gas Limited pursuant to Section
21 of the said Act for authority to
inject gas into, store gas in and
remove gas from the said areas and to
use the land in the said areas for
such purposes.

BEFORE: R. R. Perdue, Q.C.
Presiding Member

P. E. Boisseau
Member

J. A. DeKort
Member

June 13 1986



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1. INTRODUCTION

The Application

1.1 By application dated the 7th day of June, 1985, (the Application), Union Gas Limited (Union, the Company or the Applicant) applied to the Ontario Energy Board (the Board) for a Regulation extending the boundaries of its Bickford gas storage pool in the Township of Sombra in the County of Lambton (the Bickford Pool or the Pool), and for authorization to inject, store and remove gas from the extended Pool.

The Role of the Board

1.2 Upon the filing of such an Application, Section 35 of the Ontario Energy Board Act (the Act) requires the Board to conduct a hearing to determine whether a recommendation should be made to the Lieutenant Governor to designate by regulation the requested lands as a gas storage

area. If such a Regulation is passed by the Lieutenant Governor, the Board by Section 21 of the Act may, on its own authority, permit injection, storage and removal of gas from the designated area.

- 1.3 As a result of this dual approval process, the Board holds a combined hearing to consider its recommendation to the Lieutenant Governor and its decision to permit injection, storage and removal of gas if the Regulation is eventually issued by the Lieutenant Governor.
- 1.4 The Board's decision in regard to the operation of a gas storage pool within any approved new boundaries, will therefore await the decision of the Lieutenant Governor in regard to this Report on Union's Application for a change in boundaries.
- 1.5 The question of compensation was not an issue at this hearing but may be the subject of a further hearing if the parties are unable to agree on specific amounts. The landowners who appeared at this hearing were generally in favour of the boundary extension but were very concerned as to the level of compensation.

Gas Storage in Southwestern Ontario

1.6 The procedure for designating gas storage areas as outlined above, has resulted in a number of gas storage pools being approved for use throughout southwestern Ontario for both Union and Tecumseh Gas Storage Ltd. (Tecumseh). These pools were previously gas producing reefs which are characterized by good porosity and permeability, thereby enabling the storage operator to withdraw gas rapidly during the peak demand.

1.7 Union presently has ten gas storage pools in operation with a total working capacity of $3,900 10^6 \text{ m}^3$. Tecumseh operates five pools with an annual turnover volume of $1,670 10^3 \text{ m}^3$.

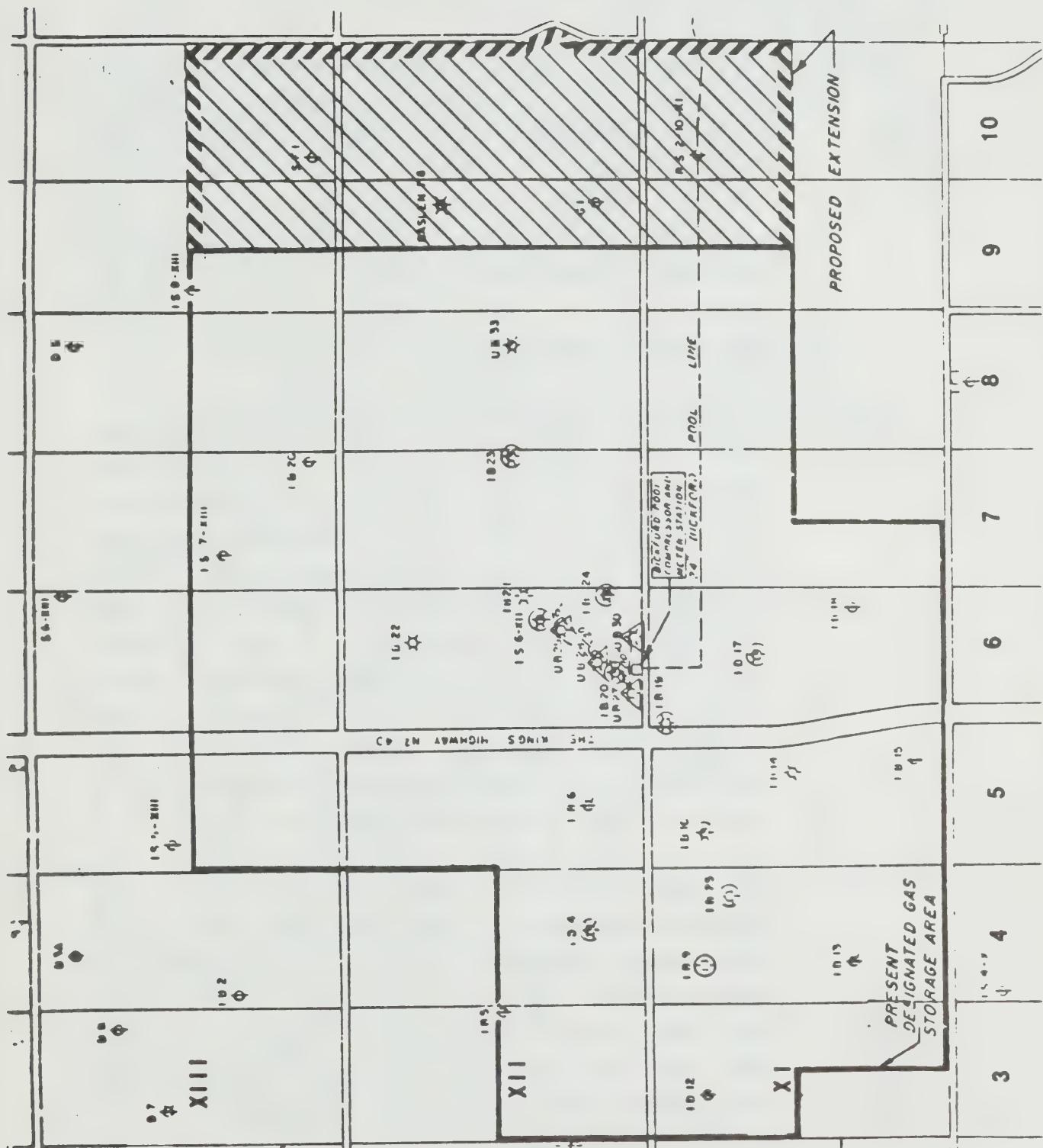
1.8 Union's witnesses testified that without such storage facilities both it and The Consumers' Gas Company Limited would be required to increase their respective contracts with TransCanada PipeLines Limited (TCPL) for contract demand gas. They testified that this would result in an increase in the unit cost of gas to their customers because their annual load factor would drop. According to Union, its storage also enables TCPL to maximize the efficient use of its pipeline system.

The Bickford Pool

1.9 The Bickford Pool is located about 33 km south of Sarnia and Figure 1 on the next page outlines the presently approved boundaries of the Pool together with that area to the east of the Pool which Union, by this Application, wishes to add to it.

FIGURE 1

BICKFORD POOL

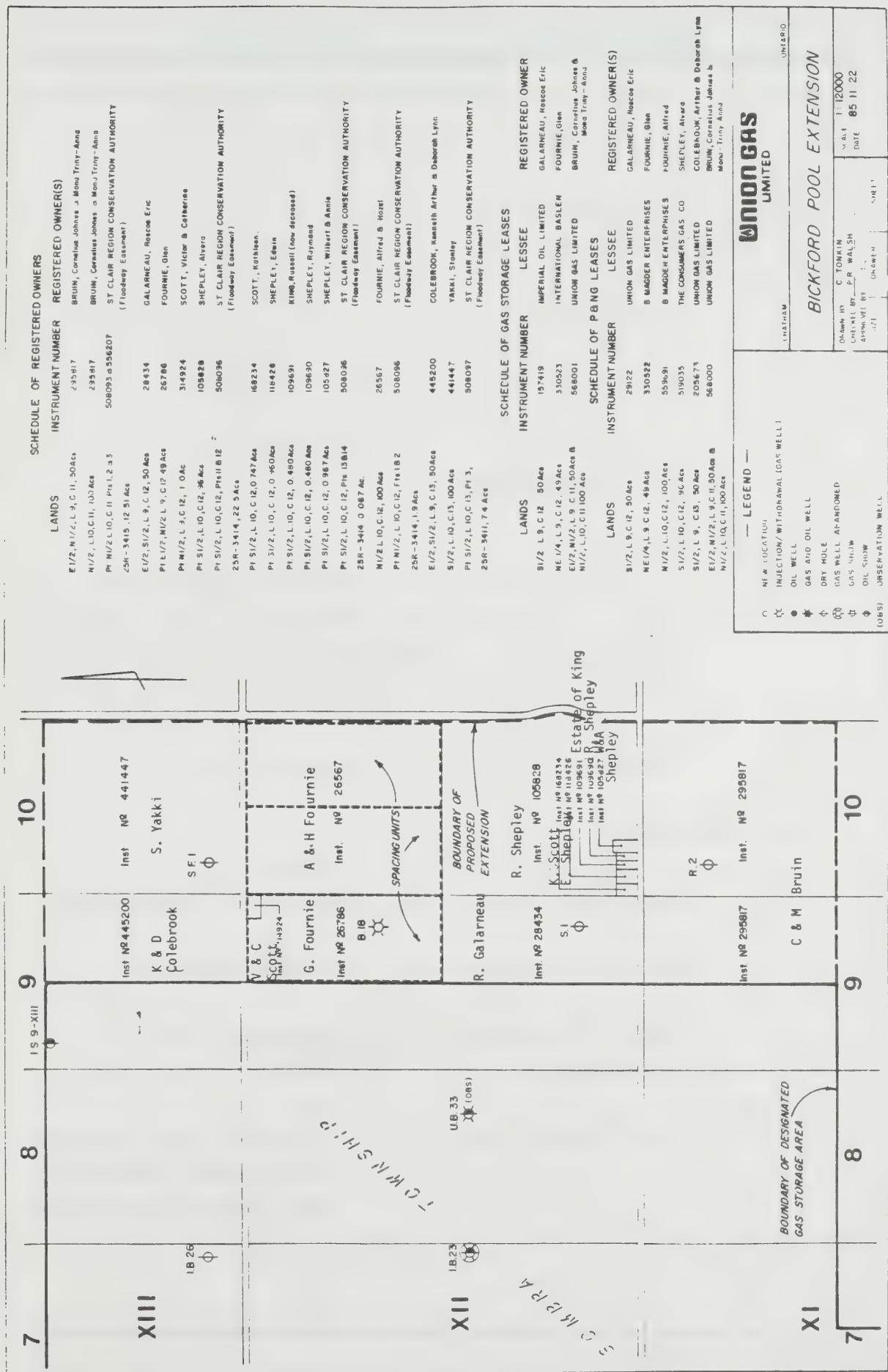


1.10 The Bickford Pool was designated as a gas storage area by Ontario Regulation 330 in 1962. Subsequently, by Order of the Board dated January 28, 1972 (E.B.O. 32), Union, as operator under a joint venture agreement with Imperial Oil Limited, was given authority to operate the Pool by injecting, storing and removing gas. It has been in use as a storage pool since that time.

1.11 By further application in 1975, Union was permitted to enlarge the Pool by designating, inter alia, lands to the east of and immediately adjacent to the then designated easterly limit of the Pool. By Board Order dated November 28th, 1975 (E.B.O. 60), Union was granted the further authority to use the newly designated area for its gas storage operations. Union stated in its evidence that the Bickford Pool amounts to $481 10^6 \text{ m}^3$ of storage capacity or approximately 18 per cent of its total working storage capacity.

1.12 Any application to designate land as a gas storage area involves the interests not only of the storage companies and their customers but the owners of the land within the boundaries of the area to be designated. Figure 2 on the next page outlines the registered owners of the land within Union's proposed extension.

FIGURE 2 LAND PLOT OF THE PROPOSED EXTENSION



2. THE HEARING

2.1 A public hearing of Union's Application was held in Sarnia from February 18th, 1986 to February 21st, 1986 and a copy of the transcript and the evidence given at that hearing is available for public examination at the Board's offices.

The Participants

2.2 The following parties appeared at the hearing:

R. R. Elliott, Q.C. Special Counsel

L.G. O'Connor Q.C. on behalf of
A. Mudryj Union

J.A. Giffen, Q.C. on behalf of B. Magder
Enterprises (Magder),
Dawn Petroleum Company

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(Dawn), Ms. Louise
Marguerite Reid, Mr.
Stanley Yaki, and Mr.
Ross Font.

2.3 The following intervenors also appeared:

M. Andreae	St. Clair Region Conservation Authority
C.J. Bruin	Landowner
K. A. Colebrook	Landowner
R. Galarneau	Landowner
A. Kimpe	Lambton Gas Storage Association

The following witnesses were called:

2.4 By the Applicant

B. J. Kemble	Manager, Engineering, Union
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P. R. Walsh

Staff Geologist,
Union

K. J. Shaw

Manager, Transmission
Storage and Production,
Union

J. R. Elenbaas

Private Consultant,
Grand Rapids, Michigan

2.5

By Mr. Giffen

B. B. Corden

Private Consultant,
Grand Rapids, Michigan

L. J. Boychuk

President, Colonial
Petroleums Limited

W. M. Neaves

Senior Chemist,
Laboratory Services,
MacLaren Plansearch
Inc.

2.6

By Special Counsel

R.M. Rybansky

Reservoir Engineer,
Petroleum Resources
Section, Ministry of
Natural Resources (the
Ministry or MNR)

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P.A. Palonen

Provincial Petroleum
Supervisor, Petroleum
Resources Section, MNR

R.A. Trevail

Chief Geologist,
Petroleum Resources
Section, MNR

3. THE EVIDENCE

3.1 Union's witnesses testified that the Application was a result of their determination that the gas bearing portion of the Pool extended to the east beyond its existing boundary. The major issue in the proceedings was whether or not a producing gas well known as Baslen-18 which is situated in the northern half of lot 9, concession XII (Fig. 2) is in communication with the Bickford Pool.

3.2 This well is owned by B. Magder Enterprises and when first drilled in 1974 was not a commercial producer, but after having been fractured in 1979, it was put on production and since that time a total of about $3.5 \cdot 10^6 \text{ m}^3$ of gas has been produced and sold to Union, the only purchaser. Production from this well has been suspended since January 11, 1985.

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3.3 Union argued that Baslen-18 threatened the integrity of the Bickford Pool by penetrating the edge of the gas storage zone and should be closed permanently by including it within the Pool boundaries within which no drilling is permitted without a reference to the Board.

3.4 On behalf of Union, Mr. Walsh testified that the Pool boundary should be extended to the west side of the road allowance between lots 10 and 11 to maintain the integrity of the Pool.

3.5 His evidence was that the Bickford Pool was situated in the Guelph formation at a subsea depth of about -1550 feet. He testified that a layer of A-1 sucrosic dolomite in the A-1 carbonate overlying the Guelph extended from the Pool easterly to Baslen-18, and that it was through this sucrosic dolomite that communication between the Pool and this well was effected.

3.6 Mr. Elenbaas, also testifying on behalf of Union, indicated that the A-1 carbonate was porous and permeable and was typically connected to an adjoining reef often extending as far as 5000 feet or more from the base of a gas reef.

3.7 He concluded that Baslen-18 was in a common reservoir with the Bickford Pool based on gas analysis, pressure readings from the observation well between the reef and Baslen-18, pressure buildup after production and production-pressure decline curves.

3.8 Mr. Corden testifying on behalf of the owners of Baslen-18, said that his examination of the well data and log analysis from Baslen-18 and other nearby wells, led him to conclude that "on a balance of probabilities" there was a "substantial accumulation of gas in and adjacent to the Baslen-18 well and that it is distinct from the Bickford Storage Pool."

3.9 On the basis of these and other tests, Mr. Corden determined that there was approximately $14.7 \ 10^6 \text{ m}^3$ of gas in a separate pool in the immediate area of Baslen-18.

3.10 Mr. Boychuk also testified on behalf of the owner that the remaining gas reserves in the well were approximately $1.6 \ 10^6 \text{ m}^3$ and that although communication with the Bickford Pool was possible, other factors "such as virgin pressure in the A-1 carbonate ... normal production decline, pressure enhancement due to water encroachment, communication with a less

permeable carbonate lens and permeability barriers in the A-1 carbonate ... have to be considered."

3.11 Mr. Neaves a chemist called by Mr. Giffen concluded in his pre-filed evidence that:

- i) there were small but statistically significant changes in the gas composition between 1981 and 1984 in each of the Baslen-18 and UB-33 wells which is a Union observation well in communication with the Pool and situated between the Pool and Baslen-18 (See Figure 2, *supra*);
- ii) the change in gas composition in the Bickford Pool during the same period has tended toward the composition of TCPL gas whereas the change in gas composition in Baslen-18 has tended away from the composition of TCPL gas;
- iii) there has been no movement of gas from the Bickford Pool to Baslen-18 well.

3.12 Mr. Neaves pointed out that the changes in composition of the Baslen-18 gas between 1981 and 1984 did not follow the same pattern as those observed at the UB-33 well. This led him to the conclusion that the TCPL gas in the Pool is

not migrating to Baslen-18.

3.13 On behalf of Union, Mr. Elenbaas stated that it was not typical for a shut-in observation well such as UB-33 to be changing gas composition. His explanation was that gas from UB-33 is moving in the direction of Baslen-18 through a common A-1 carbonate strata, driven by pressure from the gas stored in the Bickford Pool and pulled by the lower pressure of Baslen-18.

3.14 Mr. Trevail on behalf of the MNR testified that the gas bearing structure of the Bickford Pool included both a Guelph pinnacle reef complex of six small interconnected pinnacle reefs and a surrounding A-1 sucrosic dolomite in a single reservoir.

3.15 He pointed out that there was a pressure interference at Baslen-18 and that the most likely source was an influx of gas or fluids from outside the drainage radius of that well. He agreed with Union that the most probable source of this interference was the Bickford Pool.

3.16 The Ministry's evidence also indicated that the size of the Bickford Pool as interpreted by Union was too small to contain the original gas in place.

3.17 Dr. Palonen, on behalf of the Ministry, recommended that the Bickford Pool be extended easterly to a line bisecting lot 10 and that it not be extended so far to the south as Union proposed. This, he submitted, would permit the gas storage area to conform more closely with Mr. Trevail's interpretation of the size and shape of the reef and that as much land as possible would remain outside the boundary to permit further drilling for gas and/or oil.

3.18 Mr. Kimpe, on behalf of the Lambton Gas Storage Association filed evidence objecting to the compensation paid to landowners within the designated boundaries. He urged the Board not to permit injection of any gas within the new boundaries until the issue of compensation was settled.

3.19 He pointed out that the present landowner compensation was inadequate and many leases Union presently holds on the property, were signed without the informed consent of the landowners. He also said that Union should determine the value of storage to the utility and that landowner compensation should be calculated using that value as a benchmark.

3.20 In argument, both Mr. Kimpe and Mr. Colebrook pointed out that the reservoir engineers and geologists were forced to rely on opinion evidence and that for that reason, he favoured the evidence of Mr. Neaves. Mr. Kimpe argued that Mr. Neaves' evidence proved that there was no communication between the Pool and Baslen 18.

3.21 Mr. Kimpe also argued that costs should not be awarded against the owners of Baslen 18 because Union's letters prior to the hearing indicated that Union was claiming that Baslen 18 was producing gas from the storage pool. He requested the Board to monitor all gas from the storage pool to ensure that the landowner compensation, which is paid on a volumetric basis, was accurate.

3.22 Mr. Colebrook indicated that he was in favor of the boundary extension on the condition that the landowner compensation was equitable. Mr. Bruin also argued for equitable compensation for all the landowners within the boundary of the Bickford Pool and indicated to the Board that he would make further comments at any hearing called for that purpose.

4. FINDINGS OF THE BOARD

4.1 For the following reasons, the Board is of the opinion that communication exists between Baslen-18 and the Bickford Pool and recommends to the Lieutenant Governor that a Regulation be issued extending the present boundaries in the manner applied for by the Applicant:

- the public interest in maintaining the integrity of the Pool outweighs any competing public interest in encouraging drilling and exploitation of any natural resources within the applied for boundary extension;
- the following Regulation was passed by the Lieutenant Governor in December, 1985 which by its wording may have prevented any well stimulation at Baslem-18 if it had been in force when the well was fractured in 1979:

No person shall complete or service, or otherwise perform work of any kind on, a well within 1.6 kilometres of a gas storage area designated by order of the Ontario Energy Board pursuant to the Ontario Energy Board Act if the completion, servicing or other work will or is likely to fracture, or create communication with, the gas reef situated within the designated gas storage area. (O. Reg. 666/85, s. 1)

- the evidence indicated that Baslen-18 only became a commercial well after it was fractured.
- the geological evidence, together with the pressure evidence indicates that there is communication between the Bickford Pool, UB-33 and Baslen 18;
- the Board is of the opinion that, taking into account the results of all the tests given in evidence, the A-1 sucrosic dolomite provides communication between the Bickford Pool and Baslen-18;
- the gas composition evidence is not conclusive nor was it strong enough to show that communication between Baslen-18 and the Bickford Pool was impossible;

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- the Ministry's more restrictive boundaries on the east side of the Pool are not necessary in this case as the evidence did not show any anticipated drilling in those areas which could prove economically exploitable without disturbing the integrity of the Bickford Pool. If, in the future, there is any evidence to show that drilling in the area, then designated as a gas storage area, does not interfere with the integrity of the Pool, the designation on that area could be removed.
- As well, the Board can only consider at this time those boundary changes to the east of the present boundary because land-owners in the the areas suggested by the Ministry were not served with any proposed boundary changes dealing with their lands. The merits of the Ministry's proposed boundary changes which were based on their outline of the Bickford Pool, were therefore not considered by the Board.

5. Costs

5.1 Only Mr. Giffen requested costs and the Board is of the opinion that the interests of his clients in the outcome of this hearing were considerable. As well, the three witnesses called by Mr. Giffen contributed to a better understanding of the issues before the Board and Mr. Giffen's clients are therefore entitled to a proportion of their costs.

5.2 However, the Board is also concerned that the hearing was prolonged by Mr. Giffen's attempt to introduce irrelevant exhibits. As well, he argued that his clients were under the impression that it was Union's contention in its pre-filed evidence that Baslen-18 was actually producing stored gas migrating from the Bickford Pool. He pointed out that this impression was not corrected until Union filed various diagrams on the first day of the hearing.

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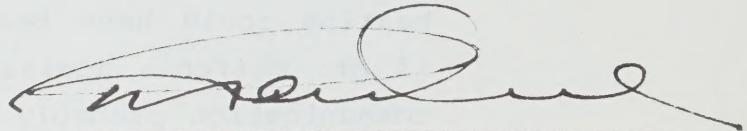
5.3 Contrary to Mr. Giffen's concern, the Board is of the opinion that Union's pre-filed evidence was sufficiently clear to indicate its position on this matter. The Board also finds that the hearing could have been shortened considerably if Mr. Giffen's admission during argument that communication probably existed between the Pool and Baslen-18 had been made earlier in the hearing.

5.4 The Board finds, therefore, that Mr. Giffen's clients are entitled to 25 per cent of their reasonably incurred costs. These intervenors shall, therefore, submit to the Board Secretary within 10 days of the issuance of this Report, a statement of such costs and following assessment, an appropriate order shall issue. As well, Union is hereby ordered to pay the Board's costs after they have been calculated and an appropriate order issued. The Board's costs will include the costs of the MNR witnesses.

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Dated at Toronto this 18th day of June, 1986.

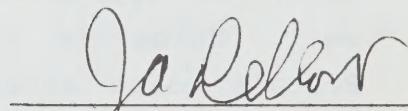
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